

**IN THE UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION**

**ERICSSON INC., and  
TELEFONAKTIEBOLAGET LM  
ERICSSON,**

**Plaintiffs and Counter-Defendants,**

**v.**

**TCL COMMUNICATION  
TECHNOLOGY HOLDINGS LTD.,  
TCT MOBILE LIMITED, and  
TCT MOBILE (US), INC.,**

**Defendants and Counter-Claimants.**

**Case No. 2:15-cv-11**

**DECLARATION OF ANDREW WOLFE  
IN SUPPORT OF DEFENDANTS'  
OPENING CLAIM CONSTRUCTION  
BRIEF FOR ERICSSON'S ASSERTED  
PATENTS**

**JURY TRIAL DEMANDED**

I, Andrew Wolfe, declare:

## **I. INTRODUCTION**

1. My name is Andrew Wolfe, Ph.D. I am currently an independent consultant, corporate board member, and Adjunct Professor.

2. I have been retained by TCL Corporation, TCL Communication Technology Holdings LTD., TCT Mobile Limited, TCT Mobile Inc., and TCT Mobile (US), Inc.

("Defendants" or "TCL") to provide my expert opinions regarding U.S. Patent No. RE43,931 (the "'931 Patent"). More specifically, I have been asked to give my opinion about the meanings of certain terms of the '931 Patent claims. I submit this declaration in support of TCL's opening claim construction brief.

3. I am being compensated for my work in this matter. My compensation in no way depends upon the outcome of this proceeding.

4. Each statement and/or finding recited herein are based in whole or in part on one or more of the exhibits listed in Section III of this declaration, and a true and correct copy of each exhibit is submitted concurrently with this declaration.

## **II. EXPERT QUALIFICATIONS AND CREDENTIALS**

5. My qualifications for presenting the opinions in this declaration are set forth in my curriculum vitae, a copy of which is attached as Appendix A to this declaration.

6. I have more than 30 years of experience as a computer architect, computer system designer, personal computer graphics designer, educator, and executive in the electronics industry.

7. In 1985, I earned a B.S.E.E. degree in Electrical Engineering and Computer Science from The Johns Hopkins University. In 1987, I received an M.S. degree in Electrical and

Computer Engineering from Carnegie Mellon University. In 1992, I received a Ph.D. in Computer Engineering from Carnegie Mellon University. My doctoral dissertation proposed a new approach for the architecture of a computer processor.

8. In 1983, I began designing touch sensors, microprocessor-based computer systems, and I/O (input/output) cards for personal computers as a senior design engineer for Touch Technology, Inc. During the course of my design projects with Touch Technology, I designed I/O cards for PC-compatible computer systems, including the IBM PC-AT, to interface with interactive touch-based computer terminals that I designed for use in public information systems. I continued designing and developing related technology as a consultant to the Carroll Touch division of AMP, Inc., where in 1986 I designed one of the first custom touch-screen integrated circuits. I designed the touch/pen input system for the Linus WriteTop, which I consider to be the first commercial tablet computer.

9. From 1986 through 1987, I designed and built a high-performance computer system as a student at Carnegie Mellon University. From 1986 through early 1988, I also developed the curriculum, and supervised the teaching laboratory, for processor design courses.

10. In the latter part of 1989, I worked as a senior design engineer for ESL-TRW Advanced Technology Division. While at ESL-TRW, I designed and built a bus interface and memory controller for a workstation-based computer system, and also worked on the design of a multiprocessor system.

11. At the end of 1989, I (along with some partners) reacquired the rights The Graphics Technology Company. Over the next seven years, as an officer and a consultant for The Graphics Technology Company, I managed the company's engineering development activities and personally developed dozens of touch screen sensors, controllers, and interactive

touch-based computer systems.

12. I have consulted, formally and informally, for a number of fabless semiconductor companies. In particular, I have served on the technical advisory boards for two processor design companies: BOPS, Inc., where I chaired the board, and Siroyan Ltd., where I served in a similar role for three networking chip companies—Intellon, Inc., Comsilica, Inc, and Entridia, Inc.—and one 3D game accelerator company, Ageia, Inc.

13. I have also served as a technology advisor to Motorola and to several venture capital funds in the U.S. and Europe. Currently, I am a director of Turtle Beach Corporation, providing guidance in its development of premium audio peripheral devices for a variety of commercial electronic products.

14. From 1991 through 1997, I served on the Faculty of Princeton University as an Assistant Professor of Electrical Engineering. At Princeton, I taught undergraduate and graduate-level courses in Computer Architecture, Advanced Computer Architecture, Display Technology, and Microprocessor Systems, and conducted sponsored research in the area of computer systems and related topics. I was also a principal investigator for DOD research in video technology and a principal investigator for the New Jersey Center for Multimedia Research. From 1999 through 2002, I taught the Computer Architecture course to both undergraduate and graduate students at Stanford University multiple times as a Consulting Professor. At Princeton, I received several teaching awards, both from students and from the School of Engineering. I have also taught advanced microprocessor architecture to industry professionals in IEEE and ACM sponsored seminars. I am currently a lecturer at Santa Clara University teaching graduate courses on Computer Organization and Architecture and undergraduate courses on electronics and embedded computing.

15. From 1997 through 2002, I held a variety of executive positions at a publicly-held fabless semiconductor company originally called S3, Inc. and later called Sonicblue Inc. I held the positions of Chief Technology Officer, Vice President of Systems Integration Products, Senior Vice President of Business Development, and Director of Technology, among others. At the time I joined S3, the company supplied graphics accelerators for more than 50% of the PCs sold in the United States. At S3 I supervised the design of several PC graphics chips.

16. I have published more than 50 peer-reviewed papers in computer architecture and computer systems and IC design.

17. I also have chaired IEEE and ACM conferences in microarchitecture and integrated circuit design and served as an associate editor for IEEE and ACM journals. I serve on the IEEE Computer Society Awards committee. I am a Senior Member of IEEE and a Member of ACM.

18. I am a named inventor on at least 43 U.S. patents and 26 foreign patents.

19. In 2002, I was the invited keynote speaker at the ACM/IEEE International Symposium on Microarchitecture and at the International Conference on Multimedia. From 1990 through 2005, I was also an invited speaker on various aspects of technology and the personal computer ("PC") industry at numerous industry events including the Intel Developer's Forum, Microsoft Windows Hardware Engineering Conference, Microprocessor Forum, Embedded Systems Conference, Comdex, and Consumer Electronics Show, as well as at the Harvard Business School and the University of Illinois Law School. I have been interviewed on subjects related to computer graphics and video technology and the electronics industry by publications such as the Wall Street Journal, New York Times, Los Angeles Times, Time, Newsweek, Forbes, and Fortune as well as CNN, NPR, and the BBC. I have also spoken at dozens of

universities including Massachusetts Institute of Technology, Stanford, University of Texas, Carnegie Mellon, University of California at Los Angeles, University of Michigan, Rice, and Duke.

### III. BASIS FOR OPINIONS AND MATERIALS REVIEWED

20. The opinions set forth in my declaration are based on my personal knowledge gained from my education, personal experience, and on the review of the documents and information described in this declaration including the '931 Patent, its related patent family and their file histories.

21. In preparation of this declaration, I have studied:

Exhibit No.	Description	Date	Identifier
1	United States Patent No. RE43,931.	March 11, 2005 (Filing Date)	'931 Patent

### IV. LEGAL STANDARDS APPLIED

22. In preparing and expressing my opinions and considering the subject matter of the '931 patent, I am relying on certain basic legal principles that counsel have explained to me.

#### A. Claim Construction in the District Court Proceeding

23. I understand that the first step in determining the validity of an asserted claim is for the claim to be properly construed and that the second step is determining whether the accused systems or methods infringe or invalidate the claims, as properly construed.

24. I understand that each challenged claim must be supported by the specification and the file history but generally should not be limited to a preferred embodiment described in the specification. I am informed that claim terms be given their ordinary and customary

meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. I also understand that any special definition for a claim term must be set forth in the specification with “reasonable clarity, deliberateness, and precision.”

25. I provide my opinions in this report based on the guidelines set forth above.

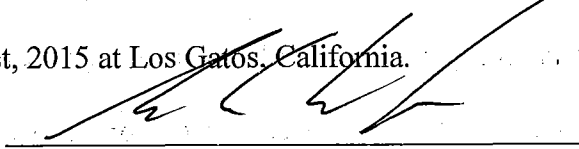
#### **V. THE PERSON OF ORDINARY SKILL IN THE ART**

26. I understand that the hypothetical person of ordinary skill is presumed to have knowledge of all references that are sufficiently related to one another and to the pertinent art, and to have knowledge of all arts reasonably pertinent to the particular problem that the claimed invention addresses.

27. I also understand that a person of ordinary skill in the art (“POSITA”) is also a person of ordinary creativity, not an automaton. A person of ordinary skill, while not someone who undertakes to innovate, is capable of drawing inferences and taking creative steps. I understand that the hypothetical person of ordinary skill is a person of ordinary skill at the time of the alleged invention.

28. In my opinion, a POSITA with respect to the '931 Patent would have had a bachelor's degree in computer engineering, electrical engineering, or computer science, and two years of experience with touch-based user input systems or equivalent education and experience on December 30, 1997, the date that the parent application to the '931 Patent was filed. Such a person would be capable of reading and understanding the '931 Patent disclosure and practicing the claimed invention. I was a person of at least ordinary skill as of December 30, 1997 and had supervised other persons of ordinary skill at that time.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed this 28th day of August, 2015 at Los Gatos, California.

A handwritten signature in black ink, appearing to read 'Andrew Wolfe', is written over a horizontal line.

Andrew Wolfe, Ph.D.